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Critical notes on some Formosan Euphorbiaceae (I)

By

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クロイツァー・原 寛：臺灣産たかとうだい科植物ニ就テ（其一）

A great deal of confusion has so far resulted from the fact that botanic work in China, Indo-China and Formosa has been conducted along independent lines by botanists who have studied in particular any one of these floras. Such confusion has been particularly great in the case of the Euphorbiaceae, which in the region of the Yellow Sea presents very difficult problems of classification and of distribution. It has been our purpose to bring together and to interpret at least some of the Formosan species in function of their allies or presumed allies endemic on the Asiatic mainland. Our work has been made possible by the cooperation of Prof. T. NAKAI, Director of the Botanical Institute of the Faculty of Science of Tokyo Imperial University, who has generously consented to loan the types of these species, thus making it possible to bring together for a critical comparison the historic material of the herbarium of Tokyo Imperial University and the rich collections of the herbarium of the Arnold Arboretum. The junior author in addition wishes to acknowledge with deep appreciation the kind interest of Prof. E. D. MERRILL, Administrator of the Botanical Collections of Harvard Universtiy and Prof. M. L. FERNALD, Director of the Gray Herbarium of Harvard University to whom he stands indebted for the extension of the full facilities available in herbaria and libraries of the University.

The origin of the specimens cited is indicated as follows: TK (Herbarium of the Botanical Institute of the Faculty of Science of Tokyo Imperial

University); AA (Herbarium of the Arnold Arboretum of Harvard University); GH (Gray Herbarium of Harvard University); NY (Herbarium of the New York Botanical Garden).

Antidesma pentandrum (Blanco) Merrill in Philipp. Journ. Sci. IX, p. 462 (1914); Enum. Philipp. Pl. II, p. 416 (1923)—Pax & Hoffmann in Engler, Pfl.-reich IV-147-XV, Ht. 81, p. 125 (1922) (var. *α. genuinum*)—Masamune, Short Fl. Formos .p. 118 (1936).

Syn. *Cansjera pentandra* Blanco, Fl. Filipp. p. 73 (1837).

Antidesma kotoensis Kanehira, Formos. Tree. p. 472 (1918); ed. rev. p. 329 (1936)—Yamamoto in Journ. Soc. Trop. Agric. VI, p. 558 (1934)—Masamune, l. c. (1936).

Antidesma rotundisepalum Hayata, Icon. Pl. Formos. IX, p. 98 (1920).

Nom. Jap. *Kôtô-yamahadzu.*

Specim. Exam. Formosa. Taisenseki, Koshun (Hayata, Jun. 1912 in TK.); Bankinsing (Henry, no. 176 in AA.); South Cape (Henry, no. 915 in AA.); Takao (Henry, no. 780, 1144 & 1885 in AA.).

Liukiu. Loo-Choo (Wright, no. 283, 1854 in AA.).

The Formosan material seen agrees well with that of the Philippine Islands which is identified as *A. pentandrum* by Merrill and Pax & Hoffmann. To our knowledge the type-specimen of Blanco's species is not extant.

Bridelia Balansæ Tutcher in Journ. Linn. Soc. XXXVII, p. 66 (1905)—Gehrmann in Engler, Bot. Jahrb. XLI, Beibl. 95, p. 37 (1908)—Jablonszky in Engler, Pfl.-reich IV-147-VIII, Ht. 65, p. 72 (1915).

Syn. *Bridelia pachinensis* Hayata in Matsumura et Hayata, Enum. Pl. Formos. p. 362 (1906) nom. nud.

Bridelia Kawakamii Hayata, l. c. (1906) nom. nud.

Bridelia ovata (non Decaisne) Hayata, Mater. Fl. Formos. p. 263 (1911); Gen. Ind. Fl. Form. p. 65 (1917)—S. Suzuki in Sylvia IV, p. 135 (1933)—Kanehira, Formos. Tree. ed. rev. p. 333, fig. 288 (1936)—Masamune, Short Fl. Formos. p. 118 (1936).

Bridelia pubescens (non Kurz) Jablonszky, l. c. p. 73 (1915) quoad specim. Formosa.

Nom. Jap. *Maruyama-kanko* (HAYATA 1917), *Kawakami-kanko*.

Specim. Exam. Formosa. Chosokei (NAKAHARA, no. 156, Jul. 1905 in TK.); Shirin (TANAKA & SHIMADA, no. 11058 & no. 11164, 1932 in AA.); Vicinity of Taihoku (TANAKA, no. 101, Jul. 1929 in AA.); sine loco speciali (OLDHAM, no. 498, 1864 in GH.).

Liukiu. Is. Iriomote (J. L. GRESSITT, no. 565, Aug. 1934 in AA.).

Dist. Liukiu, Formosa, China (Kwangtung, Kwangsi, Hainan, Yunnan) and Indo-China.

This plant is most closely related to *B. pubescens* KURZ, which has leaves pubescent along the nerves beneath. The leaves of *B. Balansæ* are glabrous or very minutely adpressed-hairy on the lower surface. *Bridelia ovata* DECAISNE is a quite distinct species which has depressed globular fruits with 2 locules and glabrous calyces.

We retain *Glochidion* basing the generic name upon a concept which is purely that of 'a natural group', because we are satisfied that the so called "generic characters" used to segregate this genus from *Phyllanthus* are ephemeral. The Indian members of the genus are indeed an homogenous unit, which differs from *Phyllanthus* in "the total absence of a disk, in habit, and in the singular modification of its styles and stigmas" (HOOKER fil. Fl. Brit. India V, p. 306, 1887), but this is far from being the case in other regions, e.g., Australasia, in which *Glochidion* is common, and in which *Glochidion* probably originated. Discrete styles are present in *G. sericeum*, for instance, which J. D. HOOKER fil. lists (op. cit., p. 326), and controverts J. D. HOOKER's very note that styles of the genus are "singularly modified" by comparison with *Phyllanthus*. The habit of *Sauropus Llanosi* is so completely that of a *Glochidion* that it has for a long time been classified under *Glochidion*, which obviously renders the habit character untenable as generic. The absence of a disk does not separate *Glochidion* from *Phyllanthus*, as J. D. HOOKER and others believe, because rudimentary disk-glands occur in the first three series of *Phyllanthus*, sensu MÜLL.-ARG., that include the true *Glochidion* (cf. DC. Prodr. XV–2, p. 275, 1866). The mistaken belief that *Glochidion* can be treated otherwise than as a 'purely natural group' (i.e., as

an aggregate which in the last analysis is outstanding merely by intangibles) has led to several grave errors, one of which directly concerns a Japanese plant, *Phyllanthus flexuosus* (SIEB. et ZUCC.) MÜLL.-ARG. This species is treated by PAX & HOFFMANN (Nat. Pfl.-fam. 2 Aufl. 19 c, p. 58. 1931) as a *Glochidion,* which is against every one of its natural affinities and involves a very confuse concept of the classification of the entire phyllanthoid alliance. On the mistaken assumption that the absence of a disk and that undivides styles are the generic characters of *Glochidion,* LÉANDRI has published a *Phyllanthus* as *G. Perrieri* (Bull. Soc. Bot. France LXXXI, p. 606, 1934) which needlessly confuses the range of all the natural groups in the vicinity of *Phyllanthus.* We believe that the best argument ever introduced for the maintenance of *Glochidion* as a distinct genus is that of HOOKER (op. cit., p. 306), who acknowledges his keeping the genus as distinct to "comply with the wishes of Indian botanists, whose opinion it is of importance to consult in regard to the nomenclature of so very large and universally distributed an Indian genus". This frank and authoritative statement of the ultimate reasons why a genus should be maintained or rejected is accepted by us as the best answer to be given when certain genera of the Euphorbiaceae are challenged because some of their characters happen to be transitional with those of other genera.

Glochidion Hayatae CROIZAT et HARA, nom. nov.

Syn. *Glochidion bicolor* HAYATA, Rev. Euphorbiac. Jap. p. 18, t. II, E (1904) excl. syn., quoad specim. et descr.—MATSUMURA, Ind. Pl. Jap. II-2, p. 306 (1912)—HAYATA, Gen. Ind. Fl. Form. p. 66 (1917).

Glochidion hypoleucum (non BOERLAGE 1900) HAYATA, Icon. Pl. Formos. IX, p. 95 (1920)—YAMAMOTO in Journ. Soc. Trop. Agric. VIII, p. 153 (1936)—KANEHIRA, Formos. Tree ed. rev. p. 346, fig. 301 (1936)—MASAMUNE, Short, Fl. Formos. p. 120 (1936).

Nom. Jap. *Urajiro-kankonoki* (HAYATA 1904), *Takasago-kekankonoki, Kobano-kankonoki.*

Specim. Exam. Formosa. Tamsuy (OLDHAM, no. 499, 1864 in AA.); in montibus Kelung (FAURIE, no. 435, Mai 1903 in AA); Tikusiko, Taihoku

(SASAKI, Oct. 1923 in AA.); Giochi, Holisha (HAYATA, Apr. 28, 1916—type of *G. hypoleucum* HAYATA in TK.); Pak-kang-khoe, Tsuisia, Polisia (K. MIYAKE, Jan. 21, 1898 in TK.).

Liukiu. Liukiu-hontô (MATSUMURA, Mai 1897 in TK.).

Kyushu. Is. Amami-Ôshima, Mt. Uwan (S. SAITO, Nov. 1927); Inter Nishinakama et Higashinakama (S. SAITO, Nov. 1927).

China. Kwangtung: Wat Shui Shan (W. Y. CHUN, no. 7401, Nov. 9, 1928 in AA.); Tung Koo Shan, Tapu Dist. (W. T. TSANG, no. 21756, Sep. 1932 in AA.); Fan Shiu Shan, Wung Yuen Dist. (S. K. LAU, no. 2782, Nov. 1933 in AA.).

Glochidion dasyphyllum K. KOCH, Hort. Dendr. p. 85 (1853)—REHDER in Journ. Arnold. Arb. VIII, p. 30 (1926)—YAMAMOTO in Journ. Soc. Trop. Agric. VIII, p. 152 (1936) pro parte—KANEHIRA, Form. Tree. ed. rev. p. 343, fig. 297 (1936)—MASAMUNE, Short. Fl. Formos. p. 120 (1936).

Syn. *Glochidion molle* (non BLUME 1825) HOOKER et ARNOTT, Bot. Beechey Voy. p. 210 (1836).

Glochidion Arnottianum MÜLL.-ARG. in Linnaea XXXII, p. 60 (1863)—FORBES & HEMSLEY in Journ. Linn. Soc. XXVI, p. 424 (1894)—HENRY, List. Pl. Formos. p. 82 (1896) pro parte—HAYATA, Gen. Ind. Fl. Form. p. 66 (1917); Icon. Pl. Formos. IX, p. 94 (1920).

Phyllanthus Arnottianus MÜLL.-ARG. in Flora XLVIII, p. 370 (1865); in DC., Prodr. XV-2, p. 279 (1866).

Glochidion moluccanum (non MÜLL.-ARG.) var. HENRY, l. c. (1896)—MATSUMURA et HAYATA, Enum. Pl. Formos. p. 361 (1906)—MASAMUNE, l. c. p. 121 (1936).

Glochidion hirsutum MÜLL.-ARG. sensu HAYATA, Rev. Euphorbiac. Jap. p. 17, t. II. D (1904); Gen. Ind. Fl. Form. p. 67 (1917)—MATSUMURA, Ind. Pl. Jap. II-2, p. 306 (1912).

Nom. Jap. *Ôbano-kekankonoki* (HAYATA 1904), *Aka-kanko* (HAYATA 1917).

Specim. Exam. Formosa. Tamsuy (OLDHAM, no. 491, 1864 in AA.); Giran (E. H. WILSON, no. 10158, Mar. 1918 in AA.); Takao (HENRY, no. 1929, no. 2038 in NY.).

The determination of the limits of this species, both as to nomenclature and as to actual range, presents at this hour difficulties which are overwhelming. We accept *G. dasyphyllum* as valid, because this binomial is of well known application and has been current on the majority of the collections from coastal China. We are not certain, however, that this name has priority, because it is possible that *G. dasyphyllum* and *G. hirsutum* (ROXB.) VOIGT are the same entity, the latter binomial being the earlier.

When publishing *Bradleia hirsuta,* ROXBURGH referred (Fl. Ind. III, p. 699, 1832) to a specimen from the Prince of Wales' Island (Penang), which, therefore, is technically the type-locality. MÜLL.-ARG. cites under *P. hirsutus* (in DC., Prodr. XV–2, p. 282, 1866) only WALLICH 7861 B, "herb. ROXB." J. D. HOOKER, on his part, states (Fl. Brit. Ind. V, p. 311, 1887) that the specimen was said from ROXBURGH to have been collected near Penang, but was believed by WALLICH to have come from China. He adds that WALLICH had two plants called *B. mollis,* namely 7858, which may be *G. zeylanicum,* and 7859 which is *G. hirsutum.*

There appears that as early as 1837 there was some doubt as to the proper application of the binomial of ROXBURGH. The senior author saw in the herbarium of the Museum of Natural History of Paris a specimen, GAUDICHAUD, no. 508, bearing the label "Calcutta: plantes données par Mr. WALLICH, 1837". This specimen is labelled "*Bradleia hirsuta* ROXB.? HBC." in an handwriting which a note of SPACH in sched. indentifies as that of WALLICH. Later on the binomial was misapplied to specimens such as GRIFFITH no. 4847 from Birma, to specimens from Java and, generally speaking, to a host *Glochidion* which had hairy leaves. The matter was probably made worse by HOOKER's publishing as *G. villicaule* an entity which is synonymous with *G. eriocarpum* and became confused in the minds of many taxonomists with *G. hirsutum* which is an altogether different species. Other "hairy" species published in the regions that are, or may be the range of *G. hirsutum,* and *G. mishmiense* HOOK. f., *Phyllanthus silheticus* MÜLL.-ARG. and *Phyllanthus asperus* MÜLL.-ARG. The material of all these species available in herbarium is scanty, often restricted to the typic collection, so that it is impossible to determine with any degree of precision how and where one

entity merges with, or bounds upon another.

We have decided, consequently, to retain *G. dasyphyllum*, our concept of which we exemplify for the present on the basis of the following specimens collected outside of Formosa:

Hongkong (WILFORD); Hongkong (FORD); Hongkong (BODINIER, no. 596); Hongkong (CHUN, no. 6405); Hainan (LAU, no. 110).

Glochidion puberum (L.) HUTCHINSON in SARGENT, Pl. Wilson. II, p. 518 (1916).

Syn. *Agyneja pubera* LINNAEUS, Mant. II, p. 296 (1771).

Bradleia sinica GAERTNER, Fruct. II, p. 127, t. 109 (1791).

Glochidion sinicum (GAERTNER) HOOKER et ARNOTT, Bot. Beechey. Voy. p. 210 (1836).

Phyllanthus puberus (L.) MÜLL.-ARG. in Flora XLVIII, p. 387 (1865); in DC., Prodr. XV-2, p. 307 (1866).

Glochidion eriocarpum (non CHAMPION) HAYATA, Icon. Pl. Formos. IX, p. 95 (1920)—KANEHIRA, Formos. Tree. ed. rev. p. 344, fig. 298 (1936)—MASAMUNE, Short Fl. Formos. p. 120 (1936).

Nom. Jap. *Akage-kankonoki, Koba-kekankonoki.*

Specim. Exam. Formosa. Musha (TANAKA, no. 476, Oct. 1929 in AA.); Suisya, Taityu (SASAKI, Jul. 29, 1922 in AA.).

Dist. China and Formosa.

G. eriocarpum CHAMPION is readily distinguished from this plant by having branches, leaves, pedicels and fruits velutinous-tomentose with patent hairs, and ovate or ovate-lanceolate leaves roundish at the base.

Glochidion philippicum (CAVANILLES) C. B. ROBINSON in Philipp. Journ. Sci. IV, p. 103 (1909)—MERRILL, Enum. Philipp. Pl. II, p. 401 (1923)—YAMAMOTO in Journ. Soc. Trop. Agric. VIII, p. 154 (1936)—MASAMUNE, Short Fl. Formos. p. 121 (1936).

Syn. *Bradleia philippica* CAVANILLES, Icon. et Deser. Pl. p. 48, t. 371 (1797).

Bradleia philippensis WILLDENOW, Sp. Pl. IV, p. 592 (1805).

Actinodaphne Sieboldiana MIQUEL in ZOLLINGER, Syst. Verz. II, p. 116 (1854)—MEISNER in DC., Prodr. XV-1, p. 215 (1864); fide KOIDZUMI.

Glochidion philippinense BENTHAM, Fl. Hongk. p. 314 (1861).

Phyllanthus philippinensis (BENTHAM) MÜLL.-ARG. in Flora XLVIII, p. 376 (1865); in DC., Prodr. XV-2, p. 295 (1866).

Glochidion Arnottianum (non MÜLL.-ARG.) HENRY, List. Pl. Formos. p. 82 (1896) pro parte.

Glochidion formosanum HAYATA, Rev. Euphorbiac. Jap. p. 20, t. II. G (1904)—MATSUMURA & HAYATA, l. c. p. 360 (1906).

Glochidion album (non MÜLL.-ARG.) HAYATA, Mater. Fl. Formos. p. 264 (1911)—KANEHIRA, Formos. Tree. ed. rev. p. 342, f. 296 (1936)—MASAMUNE, l. c. p. 120 (1936).

Glochidion Sieboldianum (MIQUEL) KOIDZUMI, Fl. Symb. Or.-Asia. p. 25 (1930).

Glochidion dasyphyllum (non K. KOCH) YAMAMOTO in Journ. Soc. Trop. Agric. VIII, p. 152 (1936) pro parte.

Nom. Jap. *Ke-kankonoki* (HAYATA 1904), *Nanban-kankonoki* (YAMAMOTO 1936).

Specim. Exam. Formosa. Takao (HENRY, no. 713 in AA.); Bosyoto, Kuraru, Koshun (E. H. WILSON, no. 10990, Nov. 1918 in AA.); Formosa (Iter WARBURG, no. 10393 in AA.) Thian, Pi-lam, Taito (K. MIYAKE, Dec. 23, 1899 in TK.—Type of *G. formosanum*); Akô (E. MATUDA, Aug. 1915 in AA.); Garanpi, Koshun (S. SAITO, Nov. 1924); Bankinsing (FAURIE, no. 202 in NY.).

Dist. Formosa, China, Philippine and Malaysia.

Glochidion assamicum (MÜLL.-ARG.) HOOKER fil., Fl. Brit. Ind. V, p. 319 (1887).

Syn. *Phyllanthus assamicus* MÜLL.-ARG. in Flora XLVIII, p. 378 (1865); in DC., Prod. XV-2, p. 297 (1866).

var. **magnicapsulum** CROIZAT et HARA, var. nov.

Syn. *Glochidion* sp. HENRY, List. Pl. Formos. p. 82, no. 937 (1896) pro parte.
Glochidion lanceolatum (non HAYATA) YAMAMOTO in Journ. Soc. Trop. Agr. VIII, p. 153 (1936).

Capsula major 8–10 mm. in diametro pubescens. Calyx florum ♀ ca. 2.5 mm. in diametro.

Nom. Jap. *Henry-kankonoki* (nov.).

Spec. Exam. Formosa. Bankinsing (HENRY, no. 117, fr.—type in AA., isotype in NY.); ibid. (HENRY, no. 415, ♂ fl. in AA. & NY.).

In determining this entity we have used the material at hand which, so far as Formosan collections, includes only one specimen in fruit (HENRY, no. 117). In this specimen the capsule and the calyx of the female flower are larger than those of classic Indian specimens such as Assam (MASTERS). This may be interpreted as an indication that the Formosan plant actually differs from the Indian species in regard to some details of the fruit. It may, conversely, be merely an individual variation, or the result of a micro- and a macrocarpous form's being endemic both in Assam and in Formosa. Feeling unable to settle the issue with the material now available we have preferred to treat the Formosan plant as conspecific with the Indian collections. We have been encouraged to do so in view of the fact that the range of *G. assamicum*, as here defined, is continuous from Assam to Hainan and to Formosa, and both micro- and macrocarpous forms occur in Hainan. We suspect that the distribution of *Glochidion* in the tropical Far East has taken place in roughly parallel broad zones which run without, or almost without break from India to Indo-China and adjacent islands, in part including Formosa. On the significance of this distribution we may merely speculate at this hour; the possibility is not excluded that it may be connected in some undetermined manner with preexisting sea-shores or other geographical peculiarities which have materially changed after the original distribution of the genus had been effected approximately within the existing range.

In Formosan specimen (HENRY, no. 415) the pedicels of the ♂ flowers are capillary, attaining to 1.5 cm long, but they appear to be variable in Indian specimens, being quite capillary and manifestly flexuose (PARKER, LAHORE) or short and somewhat stiffly borne (MASTERS). The characters of venation and of vegetation are shown to be reasonably constant by the large collection which we have been able to consult. As stated, the only character of which we have knowledge and might be significant is the size of the capsule and, perhaps, the tendency of the capsule of Indian specimens to become more quickly glabrous.

The following specimens, all from the Arnold Arboretum, are cited to illustrate our concept of the species outside of its Formosan range:

India. Upper Assam (JENKINS, no. 530); Assam (MASTERS); N. Bengal (PARKER); Lahore, Govt. Hort. Gardens (PARKER).

China. Yunnan (HENRY, no. 11717 & no. 11717 C; ROCK, no. 2581); Hainan (LAU, no. 3471; LIANG, no. 65034; How, no. 71680).

Indo-China. Tonkin (PÉTELOT, no. 6513 & no. 6529).

Glochidion Fortuni HANCE in Ann. Sci. Nat. ser. 4, XVIII, p. 228 (1862)—FORBES & HEMSLEY in Journ. Linn. Soc. XXVI, p. 424 (1894)—HENRY, List. Pl. Formos. p. 82 (1896)—HAYATA, Mater. Fl. Formos. p. 264 (1911); Gen. Ind. Fl. Form. p. 66 (1917); Icon. Pl. Formos. IX, p. 95 (1920)—YAMAMOTO in Journ. Soc. Trop. Agric. VIII, p. 152 (1936)—KANEHIRA, Formos. Tree. ed. rev. p. 344, f. 299 (1936).

Syn. *Phyllanthus puberus* α. *Fortunei* (HANCE) MÜLL.-ARG. in DC., Prodr. XV-2, p. 307 (1866) quoad syn. tantum.

Phyllanthus obovatus (non WILLD.) MÜLL.-ARG., l. c. (1866) quoad pl. Chin.

Glochidion obovatum (non SIEB. et ZUCC.) HAYATA, Rev. Euphorbiac. Jap. p. 19 (1904) quoad pl. Formos.—MATSUMURA et HAYATA, Enum. Pl. Form. p. 360 (1906).

Nom. Jap. *Hirami-kankonoki* (HAYATA, 1917).

Specim. Exam. Formosa. sine loco speciali (OLDHAM, no. 502, no. 503; FAURIE, no. 8198); Kelung (Iter. WARBURG, no. 9964); Sozan Daiton range, Taihoku (E. H. WILSON, no. 11217); Hokuto (FAURIE, no. 417; no. 1162); Takao (HENRY, no. 1053, no. 1216, no. 1793; E. H. WILSON, no. 9854); in monte Kwannin (FAURIE, no. 1195); omnia in AA.

We much regret that we have not been able to examine the type of *G. Fortuni* which is unavailable on account of the present international situation. We have accepted, consequently, a concept of the species which agrees with the concept generally entertained by taxonomists who have worked upon the *Glochidion* of the southern coast of China. Our concept, at least pro tempore, is exemplified by such specimen as DUNN, no. 3509 (Hongk. Herb.) from

Fukien, which was probably determined from authentic material.

The Formosan plant varies a great deal in the degree of hairiness on its branches and pedicels as well as in the shape of leaves, which are always glabrous even when young. *G. obovatum* SIEB. et ZUCC. from Japan proper differs from *G. Fortuni* by having smaller fruits, generally 6–8 mm. in diameter, shorter styles less than 0.5 mm. long, and obovate leaves with long cuneate base. Specimens from the Liukiu Islands, however, show somewhat intermediate characters between the two species.

Glochidion hongkongense MÜLL.-ARG. in Linnaea XXXII, p. 60 (1863) —FORBES & HEMSLEY in Journ. Linn. Soc. XXVI, p. 424 (1894)—HENRY, List. Pl. Formos. p. 82 (1896)—MATSUMURA & HAYATA, l. c. p. 361 (1906)—HAYATA, Mater. Fl. Formos. p. 264 (1911); Gen. Ind. Fl. Form. 67 (1917); Icon. Pl. Formos. IX, p. 95 (1920)—YAMAMOTO in Journ. Soc. Trop. Agric. VIII, p. 152 (1936)—KANEHIRA, Formos. Tree. ed. rev. p. 346, fig. 300 (1936) —MASAMUNE, Short Fl. Formos. p. 120 (1936).

Syn. *Glochidion littorale* (non BLUME) BENTHAM, Fl. Hongk. p. 314 (1861).

Phyllanthus hongkongensis MÜLL.-ARG. in Flora XLVIII, p. 371 (1865); in DC., Prodr. XV–2, p. 282 (1866).

Glochidion zeylanicum JUSSIEU sensu HAYATA, Rev. Euphorbiac. Jap. p. 17 (1904); Gen. Ind. Fl. Form. p. 67 (1917)—MATSUMURA & HAYATA, Enum. Pl. Formos. p. 360 (1906)—MATSUMURA, Ind. Pl. Jap. II–2, p. 306 (1912).

Glochidion sphaerostigmum HAYATA, Icon. Pl. Formos. IX, p. 96 (1920) pro minor. part.

Nom. Jap. *Kakibano-kankonoki* (HAYATA, 1904); *Honkon-kankonoki Seiron-kankonoki* (HAYATA 1917).

Specim. Exam. Formosa. Kelung (FAURIE, no. 1280, Nov. 1914 in AA.); Taihoku (FAURIE, no. 1832, Apr. 1915 in AA.); Vicinity of Taihoku (TANAKA, no. 35, Jun. 1929 in AA.); Takao (HENRY, no. 707 in AA.); Hokuto (FAURIE, no. 203, Dec. 1913 in AA.); ibid. (FAURIE, no. 1657, Feb. 1915 in TK.—Paratype of *G. sphaerostigmum* HAYATA).

Liukiu. Is. Okinawa: Nago (E. H. WILSON, no. 8068, Mar. 1917 in AA.).

Kyushu. Is. Amami-Oshima: in fruticetis Arbusta (FAURIE, no. 4188, Jul. 1900 in AA.).

In accepting *G. hongkongense* for this species we have followed the same line of thought which has suggested that we retain *G. dasyphyllum*. We are far from certain that *G. hongkongense* is distinct from *G. zeylanicum* of JUSSIEU. It is impossible, however, to determine with accuracy whether the Formosan plant is actually distinct from the Indian entity which examplifies the Jussieuan use of the binomial. We have found that a great deal of variation occurs in forms that may be presumed to represent *G. zeylanicum* and *G. hongkongense*, both in the length of the pedicels, in the relative size of the inflorescence and in degree of evolution of the styles, but at the same time we have not been able to connect these variations with any factor that might suggest either a geographic or a definite morphological segregation. We suspect that several local forms occur, but we do not know whether such forms are merely due to the influence of edaphic factors or represent established echotypes which deserve to be accepted as distinct, either specifically or varietally. Not unlike *G. dasyphyllum*, the present entity occurs throughout the range from India to Formosa, extending to the south into Malaysia. We base our understanding of *G. zeylanicum* not upon *Bradleia zeylanica* GAERTN., which was cited with doubt by JUSSIEU, and is illustrated in a manner that precludes a definite identification. We understand *G. zeylanicum* on the basis of the specimen in the herbarium of JUSSIEU, which has been available to us, and of other materials cited by MÜLL.-ARG.

Glochidion lanceolatum HAYATA, Rev. Euphorbiac. Jap. p. 16, t. II, C. (1904)—MATSUMURA et HAYATA, Enum. Pl. Formos. p. 360 (1906); Gen. Ind. Fl. Form. p. 67 (1917)—MATSUMURA, Ind. Pl. Jap. II-2, p. 306 (1912)—KANEHIRA, Formos. Tree. ed. rev. p. 347, fig. 302 (1936)—MASAMUNE, Short Fl. Formos. p. 120 (1936).

Syn. *Glochidion hongkongensis* (non MÜLL.-ARG.) FORBES et HEMSLEY in Journ. Linn. Soc. XXVI, p. 424 (1894) pro parte.

Glochidion sp. HENRY, List. Pl. Formos. p. 82, no. 937 (1896) pro parte.

Glochidion kotoense HAYATA, Icon. Pl. Formos. IX, p. 96 (1920)—

MASAMUNE, l. c. p. 120 (1936).

Glochidion sphaerostigmum HAYATA, l. c. (1920) pro major. part.—MASAMUNE, l. c. p. 121 (1936).

?*Glochidion kusukusensis* HAYATA, l. c. (1920)—MASAMUNE, l. c. p. 121 (1936).

Nom. Jap. *Kiirun-kankonoki* (HAYATA 1904), *Kôtô-kankonoki, Nagaba-kankonoki.*

Specim. Exam. Formosa. Kelung (MAKINO, Oct. 31, 1896 in TK.—Syntype of *G. lanceolatum*); ibid. (OWATARI, Nov. 1, 1896 in TK.—Syntype of *G. lanceolatum*); ibid. (Iter WARBURG, no. 9962 in AA.); Suisha, Sintiku (in TK., Syntype of *G. sphaerostigmum*); Kaukaukei (T. SOMA, Apr. 25, 1917 in TK., Syntype of *G. sphaerostigmum*); *Kôtôshô* (Type of *G. kotoense* in TK.); Bankinsing (HENRY, no. 829 in AA.); Formosa (OLDHAM, no. 488 & 489, 1864 in AA.).

Liukiu. Loo-Choo (WRIGHT, no. 266, 1854 in GH.); Liukiu (Yokohama Nursery Co., 1914 in AA.).

The Formosan species of *Glochidion* enumerated in this paper are distinguished as follows. *G. chademenosocarpum* HAYATA, *G. suishaense* HAYATA, and *G. longipedicellatum* YAMAMOTO which are imperfectly known are omitted.

1 { Rami foliaque pubescentes. Capsula pubescens 2
  { Rami foliaque glabri (in *G. Fortuni* rami interdum minutissime pilosi) 5

2 { Capsula 3 (–4) -locularis 5–7 mm. in diametro. Folia subtus adpresse minute pilosa, saepe glauca. Styli breviter columnares ad apicem leviter incrassati *G. Hayatae*
  { Capsula 5–7 -locularis 8–15 mm. in diametro. Folia subtus tomentosa vel molliter pubescentia, numquam glauca. Styli crassi, depresse globosi 3

3 { Folia subtus velutino-tomentosa, basi saepe rotundata ..... *G. dasyphyllum*
  { Folia subtus molliter pubescentia 4

4 { Lobi calycis elliptici pistillo paullo breviores. Capsula 10–15 mm. in diametro. Folia minora, plerumque 5 cm. longa ..... *G. puberum*
  { Lobi calycis ovati, pistillo valde breviores. Capsula 8–10 mm. in diametro. Folia majora ..... *G. phillipicum*

5 Capsula pubescens. Calyces florum ♀ parvi ca. 2.5 mm. in diametro. Folia basi vulgo cuneata. Pedicelli florum ♂ filiformes, saepe elongati *G. assamicum* var. *magnicapsulum*

Capsula glabra 6

6 Folia minora subobovata basi ±cuneata. Styli ad apicem paullo incrassati. Rami minutissime pilosi vel glabri ..... *G. Fortuni*

Folia majora. Styli subconici vel hemisphaerici 7

7 Calyces majores 5 mm. in diametro. Styli breviter conici. Folia basi vulgo rotundata ..... *G. hongkongense*

Calyces minores 3 mm. in diametro. Styli hemisphaerici leviter 6-lobati. Folia basi saepe cuneata ..... *G. lanceolatum*

(to be continued)